Summary of Current Agriculture Related Research Within California

June 7, 2005

On-Field Research

Project Name/Description	Key Project Goals	Principal Investigator and Staff	Affiliation	Funding Source	Funding	Completion Date
Improvement of PM10 emission factors for almond harvesting	Refine existing almond harvest particulate matter emissions.	R. Flocchini C. Parnell	UC Davis Texas A&M	Almond Board of California		June 2004
Improved Statewide Estimates of Ammonia Emissions from Native Soils in California	Develop California specific ammona emission factors and modeling for native soils within California	C. Krauter C. Potter S. Klooster	CSU Fresno NASA Ames CSU Monterey	ARB	$200,000	December 2004
Monitoring of Ammonia Emissions from Crop Production With a Tunable Diode Laser	Evaluate the use of a TDL system for the determination of ambient ammonia levels and ammonia emissions from specific agricultural operations.	C. Krauter D. Goorahoo B. Goodrich M. Beene	CSU Fresno	CSU Agricultural Research Initiative	$296,000 ARI to match ARB and UniSearch funding	June 2005

Livestock Research

Project Name/Description	Key Project Goals	Principal Investigator and Staff	Affiliation	Funding Source	Funding	Completion Date
Evaluating Full Dairy Reactive Organic Gas Emissions	Chemically speciate TOG samples collected at dairies. Attempt to develop emission factors for daries and some individually tested dairy processes.	C. Krauter D. Goorahoo B. Goodrich M. Beene	CSU Fresno	ARB, SJVUAPCD, Dairy CARES, CSU Foundation	$100,000 ARB About $20,000 from other sources	December 2004
Dairy Air Quality Monitoring of ROG and Ammonia in the Central Valley of California	Maintain staffing and supplies for field and laboratory work to continue the ARB funded ROG project until 2006	C. Krauter D. Goorahoo B. Goodrich M. Beene	CSU Fresno	CSU Agricultural Research Initiative	$208,000 ARI to match ARB and SJVAPCD funding	Jun-06
Agricultural sources of PM10 and ozone precursors	Compile PM10 and NH3 emission factors. Measure concentrations of VOC relevent to tO3 formation upwind and downwind of dairies	R. Flocchini C. Parnell R. Higashi	UC Davis and Texas A&M	USDA	$374,145	July 2005
Evaluating Dairy Ammonia, Methane, and Hydrogen Sulfide Emissions Using Tunable Diode Lasers	Develop real-time methods for evaluating process and time specific emission profiles for NH3, CH4, and H2S at dairies.	D. Goorahoo C. Krauter B. Goodrich M. Beene	CSU Fresno	CSU Agricultural Research Initiative	$98,000 ARI to match ARB and Boreal Lasers funding	June 2006

Project Name/Description	Key Project Goals	Principal Investigator and Staff	Affiliation	Funding Source	Funding	Completion Date
Dairy Cow Emissions in an Environmental Chamber	Place cows into an environmentally controlled chamber and evaluate speciated TOG emissions emitted directly from cows and from fresh waste products.	F. Mitloehner R. Flocchini J. Peters	UC Davis	USEPA California Dairy Research Foundation	$75,000 EPA $65,000 CDRF	Late 2004
Evaluation of Dairy Emission Mitigation Practices	Evaluate dairy PM10, 2.5, VOC, and ammonia emission mitigation practices for potential effectiveness. Includes lagoon and corral areas.	F. Mitloehner R. Zhang P. Robinson J. Fadel	UC Davis	Merced County via SWRCB	$600,000	December 2006
Measuring Broiler Emissions in Tunnel Ventilated Housing	Measure PM10, ammonia, and speciated TOG emissions emitted from a tunnel ventilated broiler house during various stages of bird growth.	M. Summers D. Duke	CDFA Foster Farms	California Poultry Federation	$40,000	Summer 2004
Evaluating Dairy Process Emissions Using Flux Chambers	Using environmental flux chambers at a working dairy, evaluate relative emission levels of individual process including lagoons, flush lanes, and corrals. The flux chamber is a plastic hemisphere about 2 feet in diameter that is placed over various locations at the dairy, and emissions evaluated.	CE Schmidt	Contractor	ARB, SJVUAPCD	$50,000 ARB $50,000 SJV	December 2004
Establishment of testing protocols for manure treatment	Complie a database of manure additives and commercial products claimed to mitigate NH3 or VOC emission. Investigate the mechanism for creating the reduction by each product. Evaluate multimedia effects of products on dairies. Develop a protocol to test the claims of reductions by the products.	D. Meyer W. Powers E. Tooman T. Cassel	UC Davis	SCAQMD		June 2004
Measurement of Organic Gases in Dairy Biogas Production Systems [PROPOSAL]	Characterize gases produced in covered liquid dairy manure retention ponds and combusted in electrical generator engines. Quantify hydrocarbon emission rates from generator engine combusting the lagoon gases.	T. Cassel R. Higashi R. Flocchini	UC Davis	To be determined	To be determined	TBD
Evaluation of Volatile Fatty Acids for Dairy Cattle Housed in an Environmental Chamber [PROPOSAL]	Quantify the levels of volatile fatty acids produced by dairy cattle in an environmental chamber. Key compounds for identification include propionic, buteric, and acetic acids.	To be determined	Possibly Texas A&M, Jazek Koziel	To be determined	$5000-10,000	TBD
Development ofan Improved Process-Based Ammonia Model for Agricultural Sources	Develop a process-based model of ammonia emissions from five types of animal feeding operations: dairy, beef, swine, chicken, and turkey.	G. Tonnesen Z. Wang R. Zhang J. Fadel G. Mansell J. Haasbeek	UC Riverside UC Davis ENVIRON International Corporation	LADCO Lake Michigan Air Directors Consortium	$250,000	September 2005

Project Name/Description	Key Project Goals	Principal Investigator and Staff	Affiliation	Funding Source	Funding	Completion Date
(Proposal undergoing ARB review & approval process - not yet awarded) Dairy Operations: An Evaluation and Comparison of Baseline and Potential Mitigation Practices for Emissions Reductions In the San Joaquin Valley	Project is designed to obtain data needed to better estimate baseline dairy emissions and to estimate the emission reductions achievable with available control technologies.	C. Krauter D. Goorahoo B. Goodrich M. Beene	CSU Fresno	ARB and possible matching funds from ARI	$250,000 ARB $250,000 ARI (tentative)	Jun-08
Covered Lagoon Digester Emission Measurements	Measurements of NH3, methane, possibly VOCs at Castelanelli Dairy in Lodi which has a covered lagoon digester installed.	Kurt Roos (EPA) Jack Martin	EPA	?	$40,000	?

Pesticide Research

Project Name/Description	Key Project Goals	Principal Investigator and Staff	Affiliation	Funding Source	Funding	Completion Date
Reducing Emissions of Volatile Organic Compounds from Agricultural Soil Fumigation	Provide information that can be used to determine if proposed methods to control VOC emissions are adequate to achieve required reductions.	S. Yates J. Gan M. Majewski D. Wang Q. Wang W. Zheng	UC Riverside	ARB	$200,000	Dec-07
Investigation of Atmospheric Ozone Impacts of Selected Pesticides	Develop methods for estimating and quantifying ozone impacts for selected pesticide compounds for which such estimates are not currently available.	W. Carter	UC Riverside	ARB	$100,000	Feb-06
Agricultural Pesticide VOC Sources and their Photochemical Ozone Formation Potential	Improve current understanding of the photochemical tO_3 formation potential of VOCs from agricultural pesticide applications in the San Joaquin Valley.	R. Flocchini R. Higashi M. Kleeman P. Green	UC Davis	USDA	$400,000	Jun-07
Commercialization of Intermittent Water Sealing	Identify optimal water management strategies for water sealing commercial-scale application of fumigants.	D. Sullivan H. Ajwa J Radewald	Sullivan Environmental Consulting	USDA	$78,000	2005

Summary of Completed Agriculture Related Research Within California

Project Name/Description	Key Project Goals	Principal Investigator and Staff	Affiliation	Funding Source	Funding	Completion Date
Interim Report Sources and Sinks of PM10 in the San Joaquin Valley, August 2001	Evaluate on-field PM10 emissions. Evaluate PM10 and ammona emissions for feedlots and dairies.	R. Flocchini T. Cassel	UC Davis	USDA		August 2001
Statewide Inventory Estimates of Ammonia Emissions from from Native Soils and Chemical Fertilizers in Fertilizers in California	Measure and model ammonia emissions from agricultural fertilizer application and natural soils. Report available at: ftp://ftp.arb.ca.gov/carbis/reports/l522.pdf	C. Krauter C. Potter S. Klooster	CSU Fresno NASA Ames CSU Monterey	ARB	$186,425	June 2001
Results of the Measurement of PM10 Precursor Compounds from Dairy Industry Livestock Waste	Using environmental flux chambers, evaluate dairy ammonia and ROG emissions. http://www.aqmd.gov/rules/proposed/pr1127.html	C. Schmidt	Consultant	South Coast AQMD		June 1996
Results of the Measurement of Volatile Organic Compounds from Livestock Wastes	Evaluate process specific VOCs from dairies in the Sacramento region.	C. Schmidt	Consultant	U.S. EPA	$25,000	January 1995
Survey Current Livestock Waste Management Practices in the South Coast Air Basin	Evaluate manure management practices in the SCAQMD http://www.aqmd.gov/rules/proposed/pr1127.html	Egigian-Nichols	Tetra Tech Inc	South Coast AQMD		January 2002
Literature Survey and National Programs, Livestock Waste Management Practices Survey and Control Option Assessment	Literature survey of waste management and control options. http://www.aqmd.gov/rules/proposed/pr1127.html	Egigian-Nichols	Tetra Tech Inc	South Coast AQMD		March 2003
Identify Potential Waste Management Practices Reducing Ammonia and VOCs, Livestock Waste Management Practices Survey and Control Option Assessment	Identify livestock practices to reduce emissions. http://www.aqmd.gov/rules/proposed/pr1127.html	Egigian-Nichols	Tetra Tech Inc	South Coast AQMD		March 2003
Emissions of Particulate Matter and Ammonia from Cattle Feedyards and Dairies: a Texas-California Partnership	Quantify the effects of water application and manure harvest frequency on PM and NH3 emission from dry lots housing beef or dairy animals (heifers).	B. Auvermann W. Harman D. Meyer	Texas cooperative extension UC Davis	national center for manure and animal waste management		Dec-03

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